From:	Crossland, Ronnie
To:	Adams, Adam; Mason, Steve; Loesel, Matthew
Cc:	Rauscher, Jon; Delgado, Eric; Turner, Philip; Petersen, Chris; Smalley, Bryant
Subject:	FW: FROM ORD: ITC Response Assistance
Date:	Friday, March 22, 2019 2:11:11 PM

From: Perovich, Gina
Sent: Friday, March 22, 2019 2:03 PM
To: Crossland, Ronnie <Crossland.Ronnie@epa.gov>
Subject: FROM ORD: ITC Response Assistance

Gina Perovich
Director, Consequence Management Advisory Division
USEPA/OLEM/OEM/CMAD
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From: Gillespie, Andrew
Sent: Friday, March 22, 2019 2:59 PM
To: Perovich, Gina <Perovich.Gina@epa.gov>
Cc: Mills, Marc <mills.marc@epa.gov>; Impellitteri, Christopher <Impellitteri.Christopher@epa.gov>; Mattas-Curry, Lahne <Mattas-Curry.Lahne@epa.gov>
Subject: FW: ITC Response Assistance

Hi Gina – below are some considerations for sampling for PFAS – there are some tricky aspects of collecting and handling AFFF and PFAS samples. The advice below is intended to make the samples as useful as possible. Marc is our lead scientist for site characterization and remediation work, and has lots of experience with PFAS.

Apologies if this is known to your folks, just want to make you aware for forwarding if you think relevant.

Andrew J. R. Gillespie, Ph. D.
Associate Director, US EPA/ORD/NERL
ORD Executive Lead for PFAS R&D

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From: Mills, Marc
Sent: Friday, March 22, 2019 12:36 PM
To: Gillespie, Andrew <Gillespie.Andrew@epa.gov>

Subject: RE: ITC Response Assistance

As to specific recommendations, you pointed out correctly to avoid fluorocarbon components in sampling. I would also add that replicate samples should be collected as opposed to large volumes that might be aliquoted for multiple analyses. Due PFAS' surfactant properties, subsampling is not viable for quantitative analyses.

There is also some concern with sampling water due to a potential for PFAS concentrating at the air-water interface. Representative sampling of PFAS, especially at high concentrations with a large mixture of non-fluorinated surfactants and other chemicals that are in the AFFF and the hydrocarbons from the tank farm, is going to be a challenge. Unfortunately, quantitative sampling techniques have not been validated for properly characterizing PFAS in this scenario. Much like the foam sampling request from Reg 5 that we provided via tech support, the literature is largely focused on other contaminants. We will be working to get this in the RAP planning process as a project but that will not provide the information needed for this request.

Also, the analytical chemistry to support this is also going to be complicated by widely varying concentrations and co-contaminants. I would expect that due to the volume of water and AFFF used, the concentrations could be so high that we are above the Critical Micelle Concentration which means the surfactants (fluorinated and non-fluorinated) will be forming complex micellar structures which result in very high concentrations well above solubility limits. So the analytical labs will require replicate samples (not subsample per the point made above) so they can screen samples at varying dilutions to avoid either contaminating their instruments with high concentrations or diluting the samples below detection. So replicate samples would give them a couple of shots at range finding and then doing a quantitative analyses. Replicates could also serve as an archive so future NTA or other analyses could be performed. Direct injection methods could also be used for range finding. No field crew wants to hear they have to collect replicates but in reality replicates are relative cheap once you are deployed compared to multiple deployments to re-collect samples and possible changing conditions.

Lastly, due to the possibility of very high concentrations, good field protocols are needed to avoid cross contamination when you may have widely ranging PFAS contamination eg moving from concentrated foam to trace levels in water/soils could result in contamination issues without proper decon and good field practices.

Bottom line messages.

1. Non fluorocarbon polymer (eg Teflon, Viton) components in the samplers or sampling handling train.
2. Good field protocols to avoid cross contamination when you may have widely ranging PFAS contamination
3. Replicate samples not subsampling or aliquoting. Extract or run the entire sample to avoid losses.
4. Replicate samples for range finding, quantitative analysis, and archiving

Let me know if you need anything further.

Marc

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